

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference AZ05-276WOWWW	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/KR 2005/003758	International filing date (<i>day/month/year</i>) 8 November 2005 (08.11.2005)	(Earliest) Priority Date (<i>day/month/year</i>) 16 November 2004 (16.11.2004)
Applicant <div style="text-align: center;">LG ELECTRONICS INC.</div>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see continuation of this first sheet.

2. ☐ **Certain claims were found unsearchable** (see continuation of this first sheet)

3. ☐ **Unity of invention is lacking** (see continuation of this first sheet)

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in the continuation of this first sheet. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the drawings to be published with the abstract is Figure No. 3

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Continuation of first sheet**Continuation No. IV:****Text of the abstract****(Continuation of item 5 of the first sheet)**

Objects of the present invention is to provide an outer rotor (R) of a motor for a direct drive drum type washing machine, in which a structure of the outer rotor is improved, to resolve throbbing of the outer rotor at the time of high speed rotation, and consequential noise, and to provide a variety of products. For this, the outer rotor having a rotor frame (100) with a bottom (110), a side wall (120) extended from a circumference of the bottom substantially perpendicular to the bottom, and magnets mounted on an inside of the side wall, wherein the bottom of the rotor frame is elevated in a direction of extension of the side wall on the whole.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 2005/003758

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁸: **H02K 9/00** (2006.01); **H02K 21/02** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁸: H02K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Espacenet, Google, Epodoc

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1018795 A1 (LG Electronics Inc) 12 July 2000 (12.07.2000) <i>The whole document</i>	1-20
A	WO 2004/069020 A2 (LG Electronics Inc) 19 August 2004 (19.08.2004) <i>page 3, line 24 to page 4, line 18; page 18, lines 10 to 14; page 20, line 21 to page 21, line 14; figures 3, 5A to 5C</i>	1-20
A	US 2003/151325 A1 (Choi et al.) 14 August 2003 (14.08.2003) <i>paragraphs [0028], [0029], [0055] to [0063], [0086] and [0087], figures 3 and 4</i>	1-20

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
9 January 2009 (09.01.2009)Date of mailing of the international search report
9 March 2009 (09.03.2009)Name and mailing address of the ISA/ AT
Austrian Patent Office
Dresdner Straße 87, A-1200 Vienna

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR 2005/003758

Patent document cited in search report			Publication date		Patent family member(s)	Publication date
EP	A	1018795	ES	T3	2301228T	2008-06-16
			US	E1	RE39416E	2006-12-05
			KR	A	20000052275	2000-08-16
			KR	A	20000051349	2000-08-16
			US	B1	6396177	2002-05-28
			CN	A	1260624	2000-07-19
WO	A	2004069020	KR	A	20040071414	2004-08-12
			KR	A	20040071413	2004-08-12
			KR	A	20040071398	2004-08-12
			KR	A	20040071394	2004-08-12
			KR	A	20040071393	2004-08-12
			CN	A	1809661	2006-07-26
US	A	2003151325	US	A1	2003151325	2003-08-14

PATENT COOPERATION TREATY

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year)	9 March 2009 (09.03.2009)P
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Applicant's or agent's file reference
AZ05-276WOWW

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/KR 2005/003758

International filing date (day/month/year)
8 November 2005 (08.11.2005)

Priority Date (day/month/year)
16 November 2004 (16.11.2004)

International Patent Classification (IPC) or both national classification and IPC
H02K 9/00 (2006.01); H02K 21/02 (2006.01)

Applicant

LG ELECTRONICS INC.

1. This opinion contains indications relating to the following items:

- ☒ Cont. No. I Basis of the opinion
- ☐ Cont. No. II Priority
- ☐ Cont. No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Cont. No. IV Lack of unity of invention
- ☒ Cont. No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Cont. No. VI Certain documents cited
- ☐ Cont. No. VII Certain defects in the international application
- ☐ Cont. No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ AT
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GLÓDI István

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Continuation No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of a translation from the original language into the following language: ENGLISH, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

Continuation No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-20	YES
	Claims ----	NO
Inventive step (IS)	Claims 1-20	YES
	Claims ----	NO
Industrial applicability (IA)	Claims 1-20	YES
	Claims ----	NO

2. Citations and explanations:

Reference is made to the following documents:

D1: EP 1018795 (A1)
D2: WO 2004/069020 (A2)
D3: US 2003/151315 (A1)

D1 relates to a structure of a rotor for a brushless motor which can improve structural stiffness, restrict noise generation by reducing vibration during the rotation, use cheap materials, reduce a fabrication cost by fabricating a back yoke and a base plate unit in a single body, improve durability, and efficiently cool a heat generated in the motor during the operation by facilitating an external air inflow. The structure of the rotor for the brushless motor includes: a steel plate frame provided with a base plate unit in a disc shape having a plurality of insertion holes at its centre portion, a plurality of radiation holes being formed at a circumferential portion of the insertion holes, a plurality of blades being formed at side portions of the radiation holes by cutting; a back yoke unit curved and extended in the upward direction, having a predetermined height at the circumferential portion of the base plate

unit; and a radius-direction enhancing unit formed at the upper end portion of the back yoke unit; one or a plurality of ring type permanent magnets fixedly connected to the inner side portion of the back yoke unit; a connecting member inserted into the insertion hole positioned at the centre, and connected to the steel plate frame; ; and a fixing unit fixing a driving shaft inserted into the connecting member and connected to the other constitutional elements.

D2 discloses a washing machine including an outer tub in a cabinet for holding washing water, an inner tub rotatable mounted on an inside of the outer tub having an agitating device rotatable mounted therein, a power transmission device having a washing shaft connected to the agitating device and a spinning shaft connected to the inner tub, a driving motor on an outside of the outer tub having a rotor assembly with a magnetism, and a hollow stator assembly arranged in the rotor, a clutch assembly for selective transmission of a driving power from the driving motor to the spinning shaft depending on operation modes, and a drain device for draining the washing water to an outside of the washing machine.

D3 discloses an outer rotor type induction motor. The outer rotor type induction motor includes a driving shaft, a stator core fixed to a frame and having a plurality of stator slots so that the driving shaft penetrates a centre of the stator core, a coil wound on the stator slots so as to form a rotating magnetic field, a rotor housing installed outside the stator core so as to maintain a predetermined slit with the stator core wherein the driving shaft is coupled through a bottom centre of the rotor housing, a rotor conductor coupled with an inner circumference face of the rotor housing so as to generate a torque by the rotating magnetic field of the coil, and a plurality of upper blades installed at an upper end of the rotor housing so as to leave a predetermined interval therebetween wherein an external air is forcibly sucked in to cool the coil when the rotor housing revolves.; The present invention secures sufficiently the space for coil winding to provide automation of winding the coil on the stator core, thereby enabling mass production to reduce product cost.

Object of the present invention is to provide an outer rotor of a motor for a direct drive drum type washing machine, in which a structure of the outer rotor is improved, to resolve throbbing of the outer rotor at the time of high speed rotation, and consequential noise, and to provide a variety of products. For this, the outer rotor having a rotor frame with a bottom, a side wall extended from a circumference of the bottom substantially perpendicular to the bottom, and magnets mounted on an inside of the side wall, wherein the bottom of the rotor frame is elevated in a direction of extension of the side wall on the whole.

Independent claim 1: „An outer rotor having a rotor frame with a bottom, a side wall extended from a circumference of the bottom substantially perpendicular to the bottom, and magnets mounted on an inside of the side wall, wherein the bottom of the rotor frame is elevated in a direction of extension of the side wall on the whole”.

None of documents D1 to D3 cited in the search report disclose nor suggest feature „the bottom of the rotor frame is elevated in a direction of extension of the side wall on the whole”. Therefore the subject matter of said claim is novel and involves an inventive step either.

Independent claims 11 and 17 include all features of independent claim 1, consequently their subject matters are also new and involve an inventive step.

Dependent claims 2 to 10, 12 to 16 and 18 to 20 add only additional features to the independent claims what they relate to, therefore dependent claims are new and involve an inventive step either.

The industrial applicability is given.